Service Tests and Utilities

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Introduction

This chapter explains how to use the built-in Service Tests and Service Utilities and what to do if any of the Service Tests fail. If possible, always perform a Service Test on the component that you are about to replace, just to make sure that is the component that has failed. If the test on that component passes, there is no need to replace it.

Phone Support

PHONE SUPPORT

In certain circumstances, a Call Agent can try and troubleshoot the Printer by requesting the Customer to perform a Service Test via the phone. Using this process, it can be determined whether the Printer requires any on-site maintenance.

Diagnostics - Self Test

Initialization Sequences

Whenever the Printer is switched ON, it automatically performs a series of internal self tests and mechanical initialization sequences. If any of the parts fail, a system error will appear and you should consult Chapter 2 - *System Error Codes*.

Entering Service Menu at Power Up - Only for Onsite Repair

If the Printer fails to initialize completely because of a System Error and you need to use the Service Menu (Service Tests and Utilities), the Printer can be powered up in Service Mode by pressing the **Up** and **Enter** keys while switching the Printer ON. This will give you access to some of the Service Tests and Utilities without having to complete the System Initialization (if you perform some of the tests, they will need to initialize the relevant part of the System).

Service Tests (Diagnostics)

The following is a list of all internal Service Tests available in the Printer. Instructions for entering the Service Tests menu are given on Page *4-4*.

1 Ink Supply Station ⇒ Page *4-6*

The purpose of this test is to verify the operation of the Ink Supply Station. A failure of the out-of-ink sensors or the springs in the Ink Supply Station will eventually damage the Printheads because the Printer will try to pump ink from an empty Ink Cartridge stall, which will cause the Printhead to dry-fire.

2 Carriage Movement ⇒ Page *4-8*

The purpose of this test is to verify the movement of the scan-axis components at several speeds. This test checks for the following problems:

- Friction problems with worn out slider rod or Carriage Bushings.
- Blockage due to problems with the Service Station.
- Problems with encoder sensing.

3 Paper Advance ⇒ Page *4-10*

The purpose of this test is to identify whether there is too much friction in the paper-axis drive system which is caused by defects with the Transmission Gears, Drive Roller or the Paper-Axis Motor.

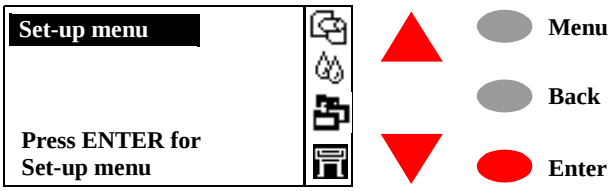
4 Troubleshooting ⇒ Page *6-4*

The Printer contains an internal **Troubleshooting** procedure which helps you to diagnose and resolve the possible source of any Image Quality or Line Quality defects. If Print Quality is poor **at anytime**, the **Troubleshooting** procedure should be performed which will determine whether the Printhead needs replacing (by marking it with an exclamation mark) or not after performing various levels of recovery actions.

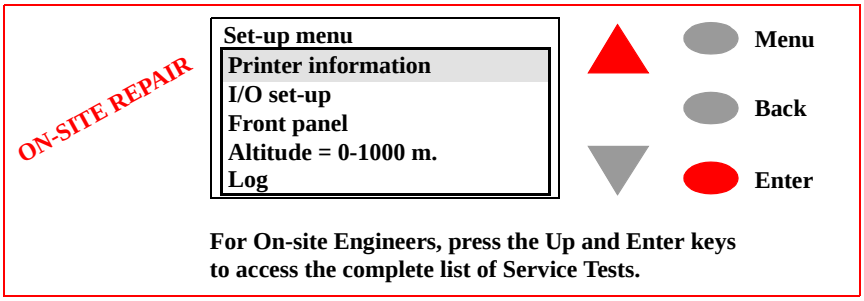
Entering the Service Tests Menu

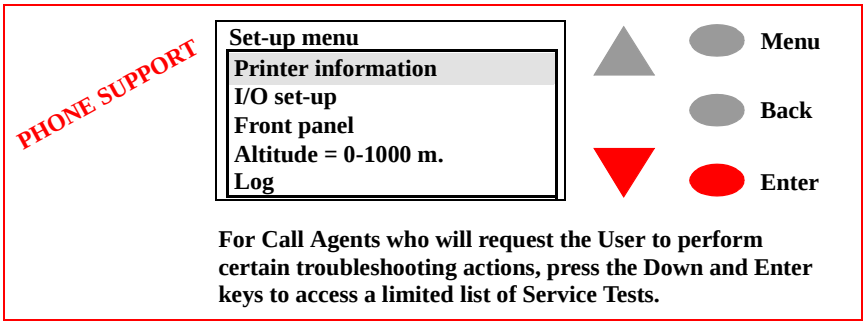
NOTE **In order to enter the Service Utility Menu, please refer to the instructions on Page *4-14*.**

1 Press the ↑ or ↓ key until the front panel displays the Setup Menu and then press **Enter**.

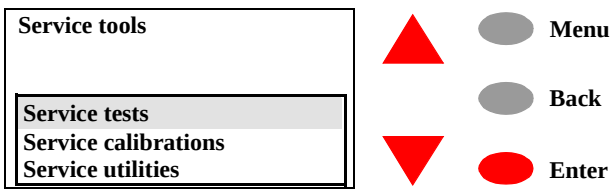


2 Once inside the Setup Menu, Press the following key combination to access the special Service Menu**.**

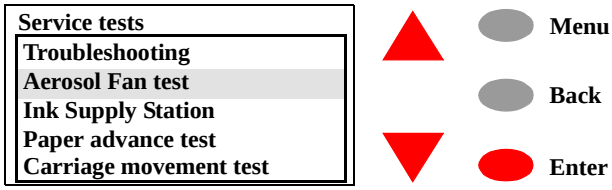




3 Once inside the Service Tools Menu, press the ↑ or ↓ key until the front panel displays **Service Tests** and then press **Enter**.



4 Press the **Enter** key to begin a specific test when the required Service Test is highlighted.



PHONE SUPPORT

Ink Supply Station

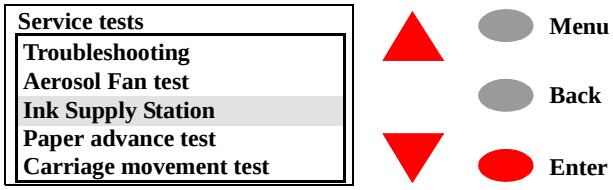
The purpose of this test is to verify the operation of the Ink Supply Station. A failure of the out-of-ink sensors or the springs in the Ink Supply Station will eventually damage the Printheads because the Printer will try to pump ink from an empty Ink Cartridge stall, which will cause the Printhead to dry-fire.

NOTE **This Service Test can be performed by the End User with the guidance of a HP Support person via the phone.**

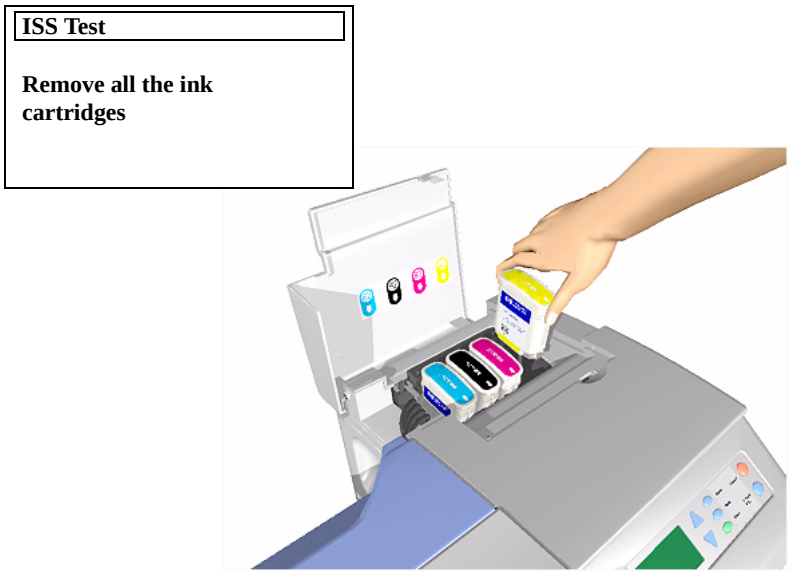
WARNING **IF POSSIBLE ALWAYS PERFORM THIS TEST BEFORE REPLACING THE INK SUPPLY STATION. IF THIS TEST PASSES, DO NOT REPLACE THE INK SUPPLY STATION.**

Perform the Ink Supply Station test as follows:

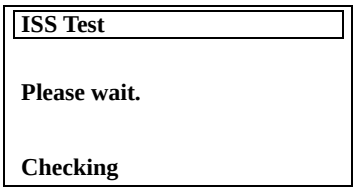
1 In the Service Tests submenu, scroll to "Ink Supply Station" and press **Enter**.



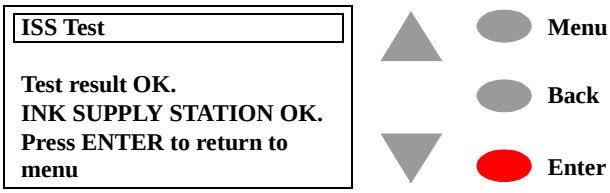
2 Once the test starts, the following message will appear on the Front Panel. Open the Ink Cartridge door and remove ALL the Ink Cartridges:



3 Once all the Ink Cartridges are removed the Printer will check the Ink Supply Station. During this short period, the following message will be displayed:

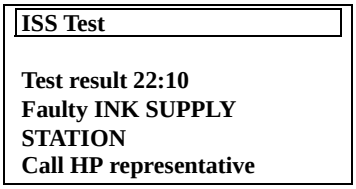


4 If the Printer detects **all** the out-of-ink signals, the Ink Supply Station has passed the test and the following message will appear on the Front Panel:



WARNING **IF THIS TEST PASSES, DO NOT REPLACE THE INK SUPPLY STATION.**

5 If the Printer does not detect all the out-of-ink signals then the Ink Supply Station must be faulty and the following message will appear on the Front Panel:



In this case, to resolve the problem, try the following:

1 *Replace the Ink Supply Station Assembly* ⇒ *Page 8-48.*

PHONE SUPPORT

Carriage Movement

The purpose of this test is to verify the movement of the scan-axis components at several speeds. This test checks for the following problems:

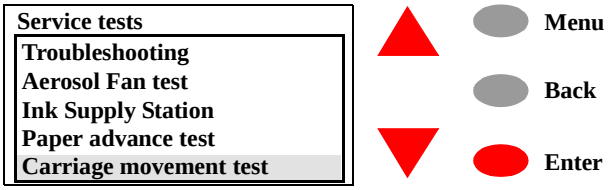
- Friction problems with worn out slider rod or Carriage Bushings.
- Blockage due to problems with the Service Station.
- Problems with encoder sensing.

NOTE **This Service Test can be performed by the End User with the guidance of a HP Support person via the phone.**

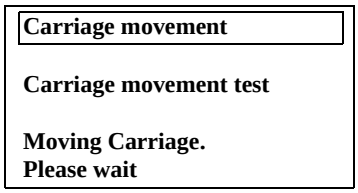
WARNING **IF POSSIBLE ALWAYS PERFORM THIS TEST BEFORE REPLACING THE CARRIAGE ASSEMBLY. IF THIS TEST PASSES, DO NOT REPLACE THE CARRIAGE ASSEMBLY.**

Perform the Carriage Movement test as follows:

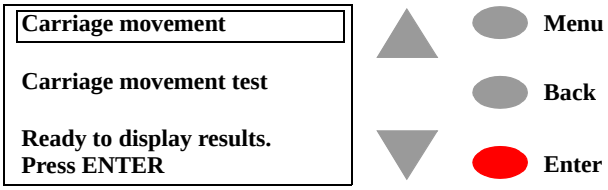
1 In the Service Tests submenu, scroll to "Carriage movement" and press **Enter**.



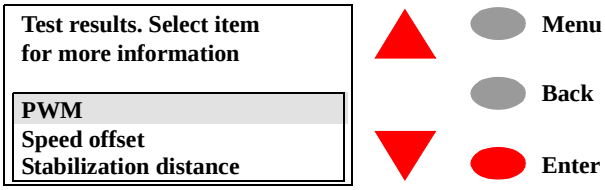
2 The test will start and the following message will appear on the Front Panel:



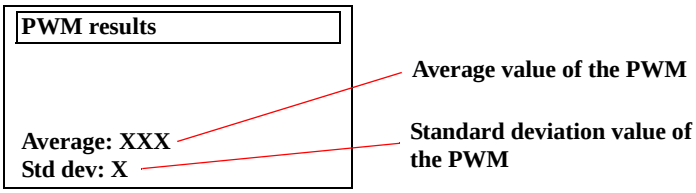
3 Once the Printer has completed the test it will analyze the data received while performing the test. Once the data has been analyzed, the following message will appear on the Front Panel:



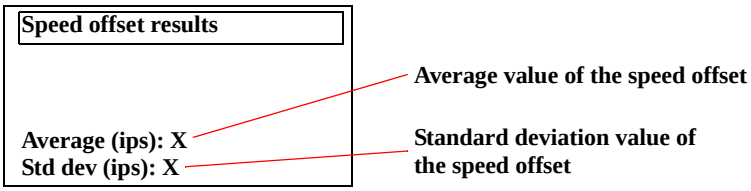
4 If you press **Enter**, the Front Panel will display a list of the different results you can view. You can make your selection using the arrow keys and press **Enter** to view the selection.



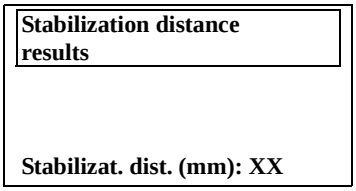
5 If you selected **PWM**, the Front Panel will display the results of the PWM test:



6 If you selected **Speed offset**, the Front Panel will display the results of the Speed offset:


Speed offset results
Average (ips): X
Std dev (ips): X
Average value of the speed offset
Standard deviation value of the speed offset

7 If you selected **Stabilization distance**, the Front Panel will display the results of the Stabilization distance:



PHONE SUPPORT

Paper Advance Test

The purpose of this test is to identify whether there is too much friction in the paper-axis drive system which is caused by defects with the Transmission Gears, Drive Roller or the Paper-Axis Motor. This test should be performed when a Paper-Axis shutdown occurs which is not caused by a paper jam.

The Paper Advance test will perform the following tests:

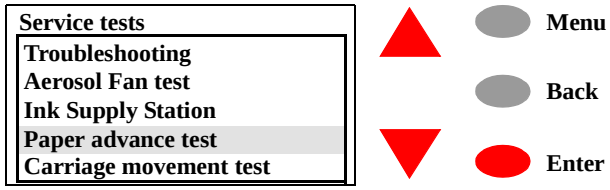
- Paper-Axis Motor test.
- Drive Roller Encoder-Sensor test.
- Drive Roller test.

NOTE **This Service Test can be performed by the End User with the guidance of a HP Support person via the phone.**

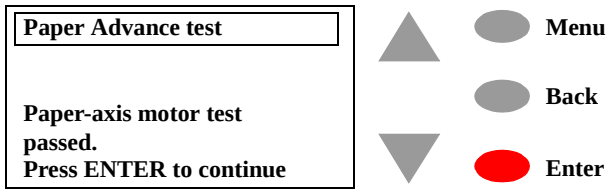
WARNING **IF POSSIBLE ALWAYS PERFORM THIS TEST BEFORE REPLACING PAPER-AXIS COMPONENTS. IF THIS TEST PASSES, DO NOT REPLACE ANY PAPER-AXIS COMPONENTS.**

Perform the Paper Advance test as follows:

1 In the Service Tests submenu, scroll to "Paper Advance test" and press **Enter**.

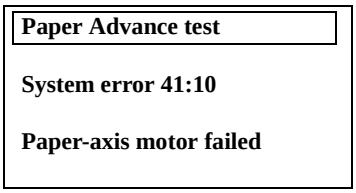


2 The test will first check if the Paper-Axis Motor is working by moving it slightly backwards and forwards. If this test passes, the following message will be displayed (press **Enter** to continue to the next stage of the test):



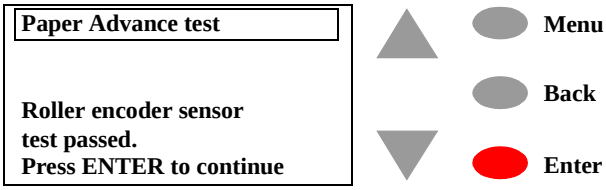
WARNING **IF THIS TEST PASSES, DO NOT REPLACE THE PAPER-AXIS MOTOR.**

3 If the test fails while checking the Paper-Axis Motor, then the following message will be displayed:



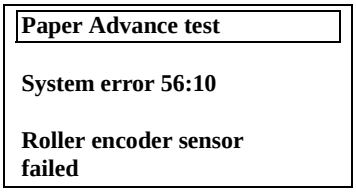
In this case, to resolve the problem, replace the Paper-Axis Motor ⇒ *Page 8-84*.

4 If the Paper-Axis Motor test passes, the Printer will try to read the Drive Roller Encoder-Sensor while moving the Paper-Axis Motor. If the Printer can read the signals from the Encoder-Sensor, then the test has passed and the following message will be displayed (press **Enter** to continue to the next stage of the test):



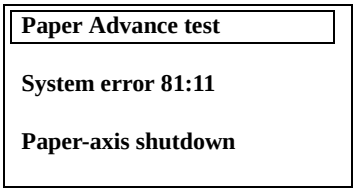
WARNING **IF THIS TEST PASSES, DO NOT REPLACE THE DRIVE ROLLER ENCODER-SENSOR.**

5 If the Printer has problems reading the signal from the Drive Roller Encoder-Sensor, then the test has failed and the following message will be displayed:



In this case, to resolve the problem, replace the Drive Roller Encoder Sensor ⇒ *Page 8-38*.

6 It is possible that while performing this test, a Paper-Axis shutdown occurs, in which case the following message will be displayed:

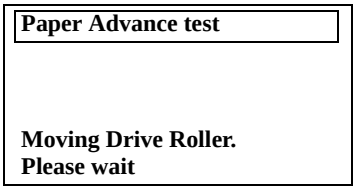


In this case, to resolve the problem, try the following:

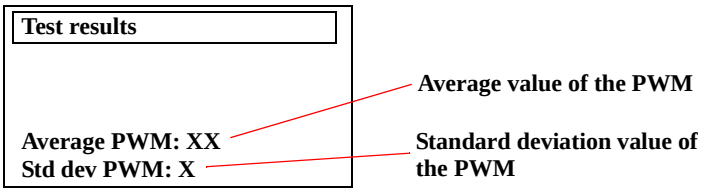
1. *Open the Window and check for any visible obstacles that could be restricting the movement of the Drive Roller.*
2. *Try cleaning the Drive Roller using the Turn Drive Roller service utility ⇒ Page 4-21. Also try cleaning the Drive Roller Gears.*
3. *Replace the Drive Roller ⇒ Page 8-86.*
4. *Replace the Gear Assemblies ⇒ Page 8-92.*

WARNING **Only replace one component at a time and try the Service Test again before replacing another component. Using this procedure you will be able to determine exactly which component failed.**

5 If the Drive Roller Encoder-Sensor test passes, the Printer will try turning the Drive Roller and the following message will appear on the Front Panel:



6 Once the test is completed, the results will be displayed on the front panel:



Service Utilities

The following is a list of all internal Service Utilities available in the Printers. Instructions for entering the Service Utilities menu are given on Page *4-14*.

1 EEROM Setup ⇒ Page *4-16*

The purpose of this Service Utility is to modify identification parameters such as serial and model numbers, as well as the Font Type. This only needs to be performed when EEROM failures cannot be recovered where both the current EEROM (located in the Main PCA) and the backup EEROM (located in the Ink Supply Station) contain false values or because both of them have failed.

2 Turn Drive Roller ⇒ Page *4-21*

The purpose of this Service Utility is to rotate the Drive Roller in order to clean it.

3 Unlock Carriage ⇒ Page *4-22*

The purpose of this Service Utility is to unlock the Carriage Assembly which is normally locked by the Service Station in order to cap the Printheads. Once unlocked, the Carriage Assembly can then be moved freely along the Printer by hand.

4 Prime Tubes ⇒ Page *4-23*

The purpose of this Service Utility is to prime the Ink Supply Tubes after they have been replaced (or if a situation arises where you need to force the priming procedure).

5 Change Cutter ⇒ Page *4-24*

The purpose of this Service Utility is to move the Cutter Assembly to a position where it can be replaced.

6 Change Ink Tubes ⇒ Page *4-25*

The purpose of this Service Utility is to move the Carriage Assembly to a position where it makes the removal of the Ink Supply Tubes much easier.

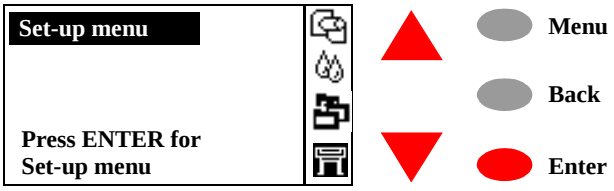
7 Printer Information ⇒ Page *4-26*

The purpose of this Utility is the following:

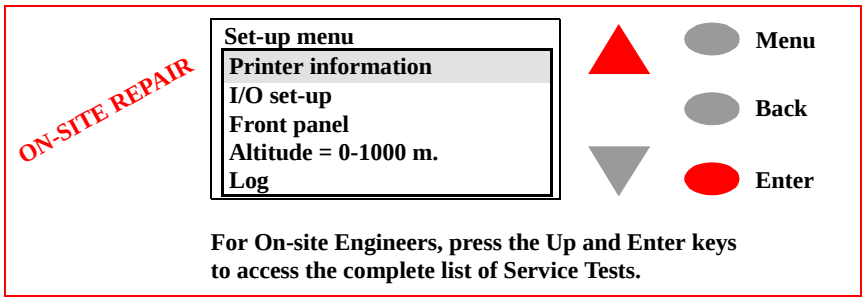
- Report basic parameters for call qualification.
- Identify potential problems.

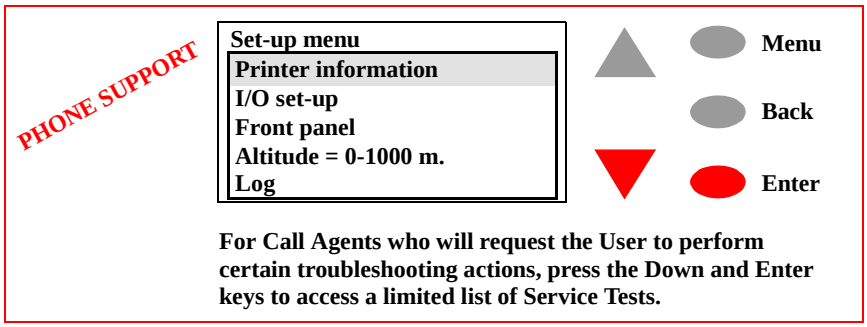
Entering the Service Utilities Menu

1 Press the ↑ or ↓ key until the front panel displays the Setup Menu and then press **Enter**.

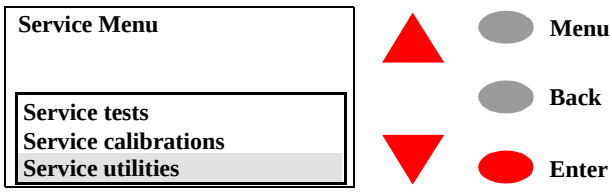


2 Once inside the Setup Menu, Press the following key combination to access the special Service Menu**.**

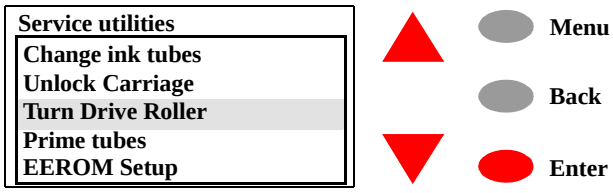




3 Once inside the Service Tools Menu, press the ↑ or ↓ key until the front panel displays **Service Utilities** and then press **Enter**.



4 Press the **Enter** key to begin a specific utility when the required Service Utility is highlighted.



EEROM Setup

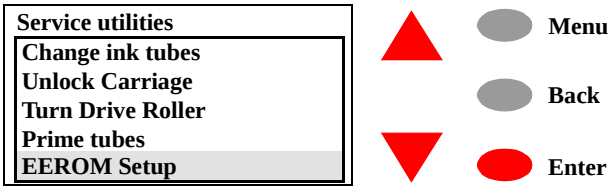
The purpose of this Service Utility is to modify identification parameters such as serial and model numbers, as well as the Font Type. This only needs to be performed when EEROM failures cannot be recovered where both the current EEROM (located in the Main PCA) and the backup EEROM (located in the Ink Supply Station) contain false values or because both of them have failed.

Also, you can use this utility to reset the usage counters for parts that have been replaced in order to correctly reflect the true usage of the relevant parts.

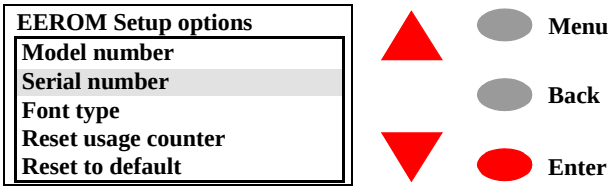
WARNING **After any change in the EEROM, switch the Printer OFF and ON again in order to ensure that the change takes effect in all the subsystems of the Printer.**

Perform the EEROM Setup as follows:

1 In the Service Utilities submenu, scroll to "EEROM Setup" and press **Enter**.



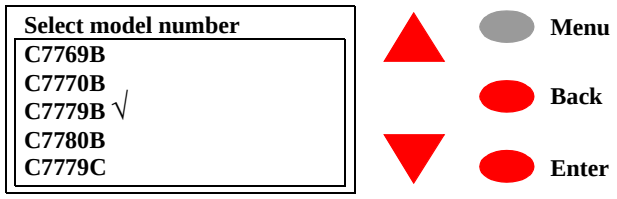
2 The Printer will display a list of EEROM Setup options. You can make your selection using the arrow keys and press **Enter** to view the selection.



If you want to select the Model Number

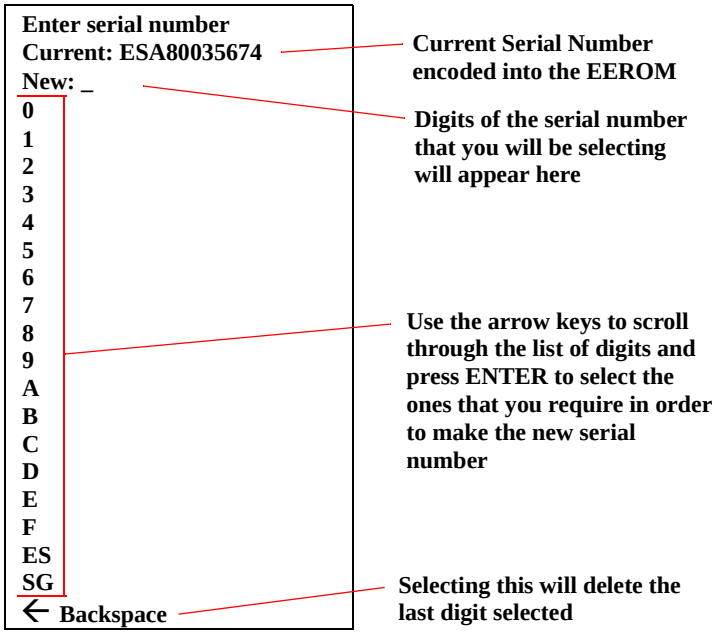
a If you want to select the Model number, then you should select "Model number" and press **Enter**. A list of all the printer model numbers available will appear on the front panel. The current model selected will have the symbol √ next to the model number. Use the arrow keys to scroll through the selections, and press **Enter** to make the selection. Once the selection is made the

symbol √ will appear next to the selected model number. To return to the EEROM setup options menu, press **Back**.

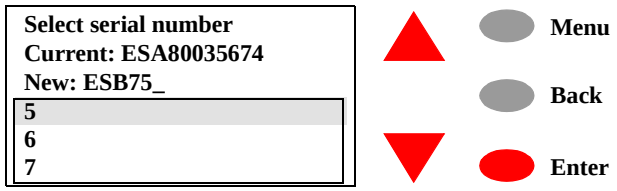


If you want to select the Serial Number

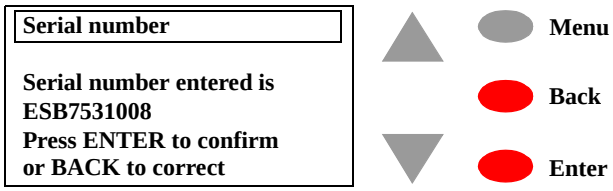
a If you want to select the Serial number, then you should select "Serial number" and press **Enter**. The following information will be displayed on the front panel. You will need to use the arrow keys to scroll through the complete list because the front panel only allows 6 lines to be displayed at one time.



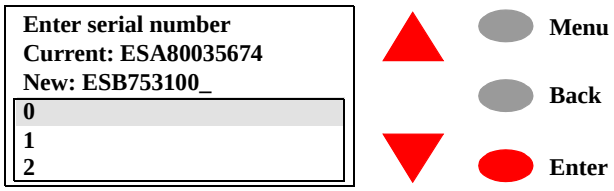
b Use the arrow keys to scroll through the list of digits. Once the digit that you require is highlighted, press **Enter** to select it and it will appear in the **New** line.



c Once you have entered the last digit of the new serial number, the front panel will display the following message:

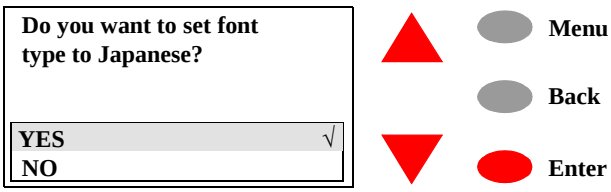


d If you press **Enter**, the new serial number will be stored in the EEROM and the Printer will return to the EEROM setup options menu. If you press **Back**, the previous screen will be displayed and the last digit of the new serial number will be deleted. You now have the opportunity to modify the new serial number.

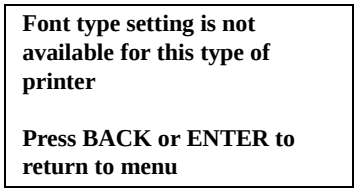


If you want to change the Font Type

a If you want to change the Font Type to Japanese, then you should select "Font type" and press **Enter**. The following message will be displayed on the front panel asking you to confirm whether you want to change the font to Japanese. Select YES and press **Enter** if you want to change to Japanese. Select NO and press **Enter** if you don't want to change the font type to Japanese.



NOTE **If the Printer is not a DesignJet 800PS, or if the Printer does not detect a formatter, the Printer will not allow you to enter this utility and will display the following message on the front panel.**

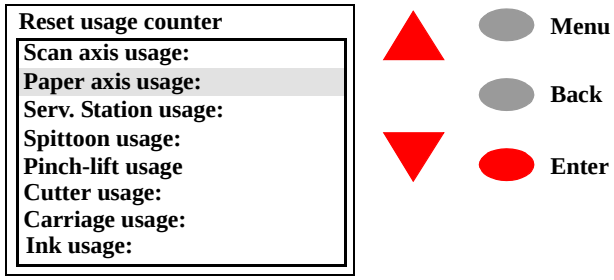


If you want to Reset the Usage Counter

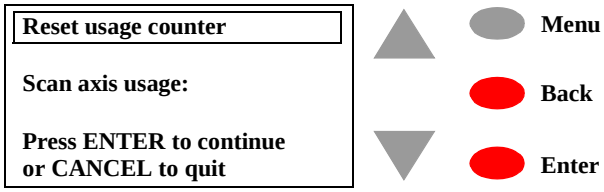
NOTE

You should only reset the usage counter for a certain component when it has been replaced by a new one. Never reset the usage counter for a component when it has not been replaced.

a If you want to reset some of the parameters of the usage counter (to consult the usage counters ⇒ Page *4-26*), then you should select "Reset usage counter" and press **ENTER**. The following information will be displayed on the front panel. You will need to use the arrow keys to scroll through the complete list because the front panel only allows 6 lines to be displayed at one time. Select the usage counter that you want to reset and then press **Enter**.



b Once you make a selection (for example Scan axis usage), the following message will appear on the Front Panel. Press **Enter** if you want to proceed with resetting the counter or press **Cancel** if you want to exit without resetting the counter:

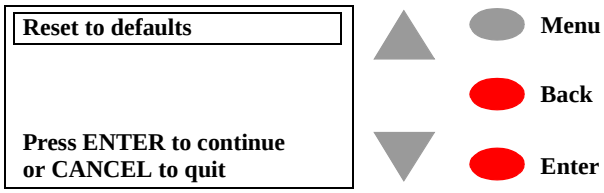


c To check if the relevant usage counter has been reset, enter the Printer Information utility ⇒ Page *4-26*.

If you want to Reset the EEROM to the Default Values

NOTE **The EEROM should only be reset if there is a major problem or if the Electronics Module has been replaced by a reused one and you need to reset the EEROM configuration. Also reset the EEROM if the Printer does not have the correct Serial Number after powering up.**

a If you want to reset the EEROM to the default values, then you should select "Reset to defaults" and press **Enter**. The following message will appear on the Front Panel. Press **Enter** if you want to proceed with resetting the EEROM or press **Cancel** if you want to exit without resetting the EEROM:



NOTE **After resetting the EEROM to the default values, you will need to re-enter the Serial Number, Model Number and the Font Type (without re-entering this information, the Printer will NOT work). DO NOT SWITCH THE PRINTER OFF AND ON AGAIN BEFORE RE-ENTERING THESE VALUES. Also you will need to perform the Factory Advance Calibration.**

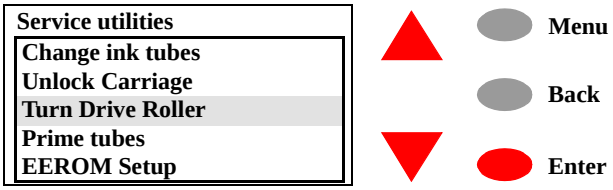
Turn Drive Roller

The purpose of this Service Utility is to rotate the Drive Roller in order to clean it.

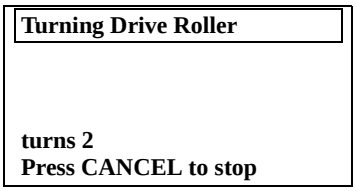
NOTE **REMOVE THE MEDIA BEFORE PERFORMING THIS OPERATION.**

Perform the Turn Drive Roller utility as follows:

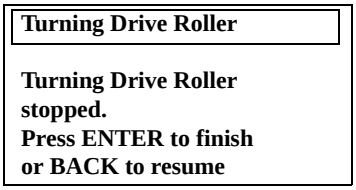
1 In the Service Utilities submenu, scroll to "Turn Drive Roller" and press **Enter**.



2 Once the utility starts, the Drive Roller will begin to turn slowly and the following message will be displayed. Everytime the Drive Roller completes a turn, the counter will increase by one.



3 If you want to stop the Drive Roller from turning, press **Cancel** and the following message will appear on the front panel. Press **Enter** if you want to return to the Service Utility menu or press **Back** if you want to continue turning the Drive Roller.

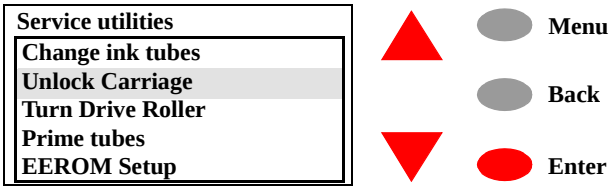


Unlock Carriage

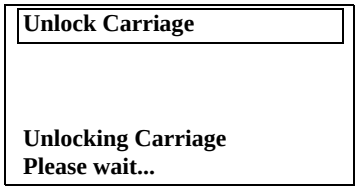
The purpose of this Service Utility is to unlock the Carriage Assembly which is normally locked by the Service Station in order to cap the Printheads. Once unlocked, the Carriage Assembly can then be moved freely along the Printer by hand.

Perform the Unlock Carriage utility as follows:

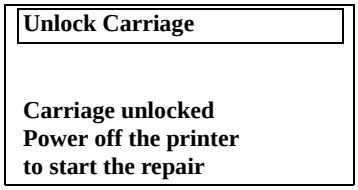
1 In the Service Utilities submenu, scroll to "Unlock Carriage" and press **Enter**.



2 Once the utility starts, the printer will begin to unlock the Carriage Assembly and the following message will be displayed on the front panel.



3 Once the Carriage is unlocked (Printheads have been uncapped) the following message will appear on the front panel:



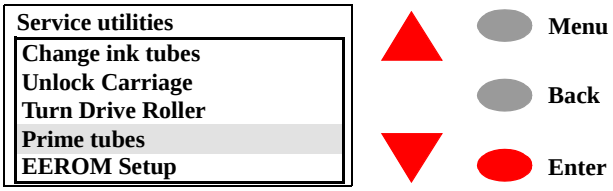
NOTE **The Carriage will remain uncapped until another action (e.g. loading paper or replacing Printheads) is selected which returns the Printer to normal operation. Make sure you leave the Carriage in a locked position once the repair is completed.**

Prime Tubes

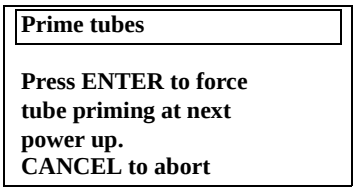
This purpose of this Service Utility is to prime the Ink Supply Tubes after they have been replaced (or if a situation arises where you need to force the priming procedure).

Prime the tubes as follows:

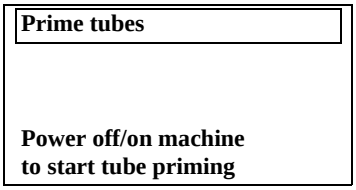
1 In the Service Utilities submenu, scroll to "Prime tubes" and press **Enter**.



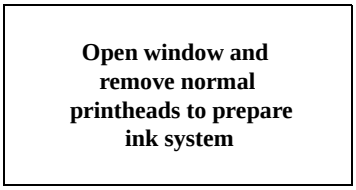
2 Once the utility starts, the printer will display the following message on the front panel. If you want to abort the Prime Tubes utility, press **Cancel** and you will return to the Service Utility menu.



3 If you press **Enter**, the following message will be displayed on the Front Panel. You should switch the Printer ON and OFF in order to start the priming process.



4 When you power On the Printer, the Printer will initialize and then display the following message. You will need to remove the normal Printheads and replace them with Start-up Printheads.



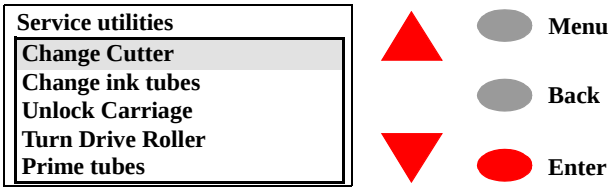
Change Cutter

The purpose of this Service Utility is to move the Cutter Assembly to a position where it can be replaced.

NOTE **In order to actually replace the Cutter Assembly, refer to Page *8-32*.**

Perform the Change Cutter utility as follows:

1 In the Service Utilities submenu, scroll to "Change cutter" and press **Enter**.



2 The Carriage will move to the left hand side of the Printer, pick up the Cutter and move it to a position where the Cutter can be replaced.

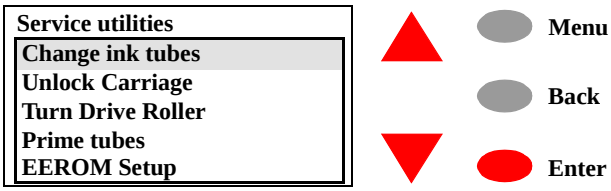
Change Ink Tubes

The purpose of this Service Utility is to move the Carriage Assembly to a position where it makes the removal of the Ink Supply Tubes much easier.

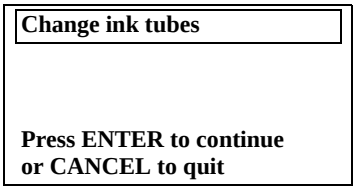
NOTE **In order to actually replace the Ink Supply Tubes, refer to Page *8-60*.**

Perform the Change Ink Tubes utility as follows:

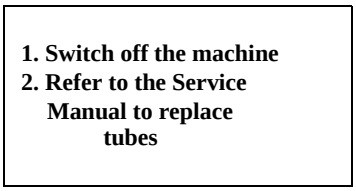
1 In the Service Utilities submenu, scroll to "Change Ink Tubes" and press **Enter**.



2 Once the utility starts, the printer will display the following message on the front panel. If you want to abort the Change Ink Tubes utility, press **Cancel** and you will return to the Set-up menu.



3 If you press **Enter**, the Carriage will move to a position where you change the Ink Supply Tubes and the following message will be displayed on the Front Panel. You should switch the Printer OFF before starting to change the Ink Supply Tubes.



NOTE **The next time the Printer is switched ON, it will automatically start the Priming process.**

Printer Information

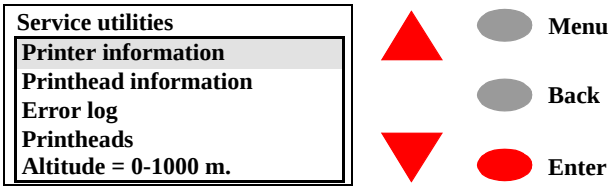
The purpose of this Utility is the following:

- Report basic parameters for call qualification.
- Identify potential problems.

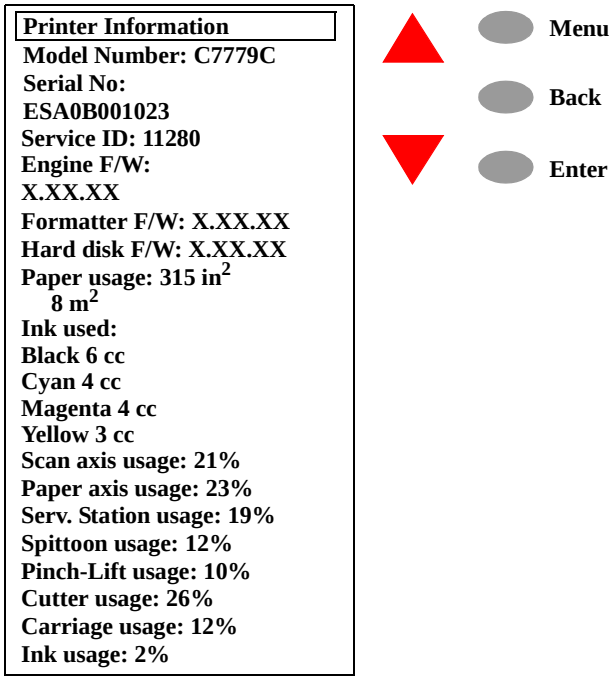
NOTE **Some of the parameters can be reset to zero by using the EEROM Setup utility (⇒ Page *4-16*).**

Check the Printer Information as follows:

1 In the Service Utilities submenu, scroll to "Printer Information" and press **Enter**.



2 The Printer will display the following information on the front panel. You will need to use the arrow keys to scroll through the complete list because the front panel only allows 6 lines to be displayed at one time.



Each parameter of the Printer Information is explained as follows:

- **Model Number** - This identifies the model type of the Printer and should be the same number as printed on the Serial Number label (located at the back of the Printer). If the Model Number on the front panel does NOT match the number on the label, then use the EEROM setup (⇒ Page *4-16*) utility to set the correct model number.
- **Serial Number** - The Serial Number should be the same number as printed on the Serial Number label (located at the back of the Printer). If the Model Number on the front panel does NOT match the number on the label, then use the EEROM setup utility (⇒ Page *4-16*) to set the correct model number.
- **Service ID** - This number identifies the date when the Printer was bought since it encodes the date when the first print was sent to the Printer. This way the end of warranty period can easily be determined without needing a proof of purchase from the customer. The Service ID format is **YYDDD**, where **YY** is the actual year since 1990 and **DDD** is the number of actual days since January 1st.

  How to calculate the Service ID from a calendar date:

  YY = calendar year - 1990 (e.g.: 1998 = (1998 - 1990) = **08**; 2001 = (2001 - 1990) = **11**)

  DDD = (Calendar month - 1) x 30 + Calendar day or 30 if the day is 31 (e.g.: Oct. 10th = (9 x 30 + 10) = **280**; Dec. 31st = (11 x 30 +30) = **360**

  How to convert the Service ID into a calendar date:

  Year = **YY** + 1990 (e.g.: **08** = (08 + 1990) = 1998; **11** = (11 + 1990) = 2001)

  Date = **DDD** divided by 30, plus one if there is a remainder, gives you the month. The remainder gives you the day of the month (e.g. **280** (280/30 = 9 + 1 = 10) = October 10th; **360** = (360/30 = 12) = December 30th)
- **Engine F/W** - The current version of the Firmware being used by the Printer and the date that it was updated.
- **Formatter F/W** - The current version of the Firmware being used by the Formatter (if it is installed).
- **Hard disk F/W** - The current version of the Firmware being used by the Hard Disk (only if the Formatter is installed).
- **Paper usage** - The amount of media used by the Printer.
- **Ink usage** - The amount of Ink used by the Printer.
- **Scan axis usage** - Number of Scan-Axis cycles represented as a percentage over the maximum number of Scan-Axis cycles that the

Printer is designed to support. If the percentage is **more than** 100% and the Printer is experiencing problems then try the following:

1 Apply Lubricant to the Drive Roller.

2 Replace the Carriage Assembly (including the Belt) ⇒ Page *8-78*.

3 Replace the Scan-Axis Motor ⇒ Page *8-29*.

- **Paper axis usage** - Number of Paper-Axis movements represented as a percentage over the maximum number of Paper-Axis movements that the Printer is designed to support. If the percentage is **more than** 100% and the Printer is experiencing problems then try the following:

  1 Replace the Paper-Axis Motor ⇒ Page *8-84*.

- **Service Station usage** - Number of Service Station cycles represented as a percentage over the maximum number of Service Station cycles that the Printer is designed to support. If the percentage is **more than** 100% and the Printer is experiencing problems then try the following:

  1 Replace the Service Station ⇒ Page *8-52*.

- **Spittoon usage** - Number of drops spitted into the Spittoon (on the left hand side of the Printer) represented as a percentage over the maximum number of drops allowed by the Spittoon. If the percentage is **more than** 100% and the Printer is experiencing problems then try the following:

  1 Replace the Spittoon ⇒ Page *8-23*.

- **Pinch-lift usage** - Number of Pinch-lift cycles represented as a percentage over the maximum number of cycles that the Printer is designed to support. If the percentage is **more than** 100% and the Printer is experiencing problems then try the following:

  1 Replace the Pinch-Lift Mechanism ⇒ Page *8-67*.

- **Cutter usage** - Number of times the Cutter has been used represented as a percentage over the maximum number of times that the Printer is designed to support. If the percentage is **more than** 100% and the Printer is experiencing problems then try the following:

  1 Replace the Cutter Assembly ⇒ Page *8-32*.

- **Carriage usage** - Number of Printhead insertions in the Carriage stall where the most Printheads have been inserted represented as a percentage over the maximum number of Printhead insertions that the Printer is designed to support. If the percentage is **more than** 100% and the Printer is experiencing problems then try the following:

  1 Replace the Carriage Assembly ⇒ Page *8-78*.